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ROLE OF HAZARD CONTROL MEASURES IN OCCUPATIONAL HEALTH AND SAFETY IN THE TEXTILE INDUSTRY OF PAKISTAN

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In Pakistan thousands of workers are routinely exposed to hazards in textile industry. There are different hazards faced by the workers of textile industry. There are different factors, which are responsible to create the hazards in the working environment. In textile these are Physical, Biological, Chemical and Ergonomic (personal) factors. There are some other aspects, which are responsible to create hazards in the work place environment i.e. shift work, smoking at work place, job strained proper use of personal protective equipments etc. The introduction of hazards technologies in industry has resulted in high accident rates, occupational diseases, and unhealthy working environments. Most workers are illiterate and do not know what protective measures should be adopted for their jobs. Most of the workforce is not prepared to cope with the hazards posed by manufacturing and industrial processes. The present study was designed to know the role of hazards control measures in Occupational Health and Safety (OHS) in textile industry. Multistage random sampling technique was used to select the 480 permanent workers respondents between the ages 30-55. Uni-variate and Bi-variate analysis shows a strong and positive association. The study proposed that awareness about hazards should improve occupational health and safety.

Keywords: Occupational health and safety, protective equipments, hazardous chemicals, textile industry, workplace environment

INTRODUCTION

Diseases and accidents in the work place are an appalling tragedy. The incidence of occupational diseases and injuries are very high in Pakistan because thousands of workers are routinely exposed to hazardous chemicals. It is well known that healthy workers are most productive. The introduction of hazards technologies in industry has resulted in high accident rates, occupational diseases, and unhealthy working environments. Most workers are illiterate and do not know what protective measures should be adopted for their jobs. Most of the workforce is not prepared to cope with the hazards posed by manufacturing and industrial processes. The country lacks the basic infrastructure and qualified personal for providing occupational health and safety services to the workforce. Thus, a huge number of workers will be at risk if no future attempts are made to improve OH&S (Ahsan and Partanen, 2001).

The use of proper lighting system is very essential in stitching units. This will better prevent our workface against many eye diseases. Workplace conditions are so unhygienic as a result workers suffer from allergies, skin rashes and other skin diseases. The ventilation system in these stitching units of textile factories is contracting to respiratory problems and diseases (Rana, 2005). The use of chemicals in manufacturing and industrial processes has expanded considerably in recent years in both the industrialized and the developing countries. Massive occupational and environmental problems are being faced resulting from the production, use, storage, transport, handling and disposal of chemicals. Currently, there are more than eight million known chemicals. Electrical current exposes workers to a serious, widespread occupational hazard; practically all members of the workforce are exposed to electrical energy during the performance of their daily duties, and electrocutions occur to workers in various job categories. Many workers are unaware of the potential electrical hazards present in their work environment, which makes them more vulnerable to the danger of electrocution. Some health problems are also caused by noise or high temperature. Noise induced hearing loss is a frequent finding among workers in noisy workplaces. Heat stress may be dangerous in it and may also predispose workers to other conditions. In hot environments it may be impossible to wear protective clothing, and consequently exposure to other hazards may occur. Under-diagnosis and under-reporting of occupational diseases lead to the belief that these are

minor problems. Hazards in the workplace are often caused by the use of materials, tools, machinery and chemicals. The present study is oriented to explore problems, needs and the factors which are responsible to maintain occupational health and safety of the workers in textile industry. It can be helpful in formulating programme and policy to solve the problems related to the health and safety of textile workers. Based upon the above discussion and facts, the following objectives have been formulated for the present research: (1) to detect the work hazards related to the working environment, (2) to investigate the factors effecting occupational health and safety in textile industry and (3) to identify the major causes of industrial accidents.

MATERIALS AND METHODS

Textile is the major manufacturing sector in Pakistan employing the greatest number of employed labour force in the manufacturing sector. As cotton is a major crop in Pakistan, the textile industry has developed as a response to the availability of the raw material. The Textile sector comprised highest number of enterprises, 2304, which employed highest number of workers i.e. 245596 (Pakistan Labour Gazatte, 2001). The introductions of modern but hazardous technologies in the industries have resulted in high rates of accidents, occupational diseases and unhealthy working environment. Pakistan lags in the enabling legislation in the area of occupational safety and health, the infrastructure to promote and enforce occupational safety and health are inadequate. A large proportion of the workforce is illiterate (thus unaware of the dangers of processes and products with which they deal) (Awan, 2002). The study was conducted in Faisalabad district of the Punjab for being famous for its textile industries. According to the distribution of economic activities and corresponding labour force in different geographical locations the highest number of textile industry situated in Faisalabad (Awan, 2002. This study was conducted in urban and rural areas of the district.

Selection of sample for the study

At the first stage out of 29 textile units from the APTMA members list, a total of 6 textile mills were selected by simple random sampling technique from all six tehsils. This is approximately 21% of the entire population. In the second stage, workers were selected from these textile mills. For the selection purpose of respondents a complete list of permanents workers between the age of 30 to 55 which having the minimum 5 years work experience were proportionally selected from all the 6 textile mills. The detail of selection is given in Table 1.

Table 1. Selection of the respondents

Name of textile mill	Total workers	Sampled workers
A	275	55
B	220	44
C	580	116
D	290	58
E	750	150
F	285	57

The total sample for this study was 480 permanent workers having the age between 30 to 55. The workers respondents were interviewed at the exit point of their working units. Different statistical tests such as chi-square, person's correlation and Gamma tests were applied to examine the relationship and the intensity of association between independent and dependent variables. The important findings are presented in this paper and some measures are suggested.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

Education is a basic human right and very necessary for socio-economic development of any nation. The education helps the workers to recognize its legal, social and medical rights. Age is also an important demographic element and it directly or indirectly influences human behavior towards occupational health and safety. The monthly income indicates the economic condition of a person.

Table 2 shows that the most (42.1%) of the respondents were middle aged (>35-50) and only One-fourth (24.4%) of the respondents belonged to old age (>50 years). 6.04% of the respondents were illiterate, 14.38 having the eight years schooling, Data further shows that (49.79%)of workers have 10 years schooling, while (29.79%) were above matric. Further data shows that (30.62%) worked in processing, while (28.96%) worked in spinning and (24.69%) in stitching units whereas the (15.62%) worked in the weaving unit. overwhelming majority (91.9%) of the respondents were male and only 8.1% were female workers. The data shows that a fair majority (64.0%) of the respondents were un- married whereas; slightly more than one-third (36.0%) were married. One-third (33.8%) of the respondents were getting their salary from Rs. 3501-5000 per month whereas, almost same number of the respondents (32.9%) reported their monthly salary up to Rs. 3500 per month. Moreover, slightly less than twenty percent were getting Rs. 5000-6500 per month and only about 15% were getting more than Rs. 6500 per month. A majority (71.5%) of the respondents belonged to rural areas whereas, slightly above than one-fourth (28.5%) were possessed urban background (Table 3).

Table 2. Distribution of the respondents according to their socio-economic characteristics

Characteristics	Frequency	Percentage
Age (years)		
Young (up to 35)	161	33.5
Middle (> 35-50)	202	42.1
Old (> 50)	117	24.4
Education		
Illiterate	29	6.04
Middle	69	14.38
Matric	239	49.79
Intermediate	143	29.79
Name of units		
Processing	147	30.62
Spinning	139	28.96
Weaving	75	15.62
Stitching	119	24.79
Gender		
Male	441	91.9
Female	39	8.1
Marital status		
Un-married	173	36.0
Married	307	64.0
Monthly salary		
Up to Rs. 3500	158	32.9
Rs. 3501-5000	162	33.8
Rs. 5001-6500	90	18.8
Above Rs. 6500	70	14.6
Residential area		
Rural	343	71.5
Urban	137	28.5
Total	480	100.0

There are different factors, which are responsible to create the hazards in the working environment of textile industry. These are physical, biological, chemical and ergomic. The effect of these hazards can be minimized by using the hazards control measures.

Great majority (83.5%) of the respondents reported that hazardous warning signs are available in the vicinity of the industries furthermore; about eighty percent of the respondents were of the view that warning signs are placed at suitable place in the vicinity of the industries. More than fifty percent (57.5%) of the respondents reported that warning signs are in Urdu language. A great majority (77.9%) of the respondents were of the view that first aid boxes are available in the industries. Only 33.5% of the respondents reported that employees were trained in procedures to be followed in the emergencies. Less than fifty percent (45.6percent) of the respondent used the protective equipments at their work places while only 12.7% of the respondents were of the view that they were satisfied by the quality of available PPEs. . Moreover, a fair majority (59.8%) pointed out that they did not wear the uniform during their working. all the respondents were of the view that there were separate stores for the chemicals. Furthermore, a fair majority (66.7%) of the respondents pointed out those chemical containers was labeled in English language. However, hand trolleys are used for the transportation of the chemicals within the enterprises as reported by majority (71.5%) of the respondents. About one-fifth (19.37%) of the respondent revealed that loader/lifter were used for the transportation of the chemicals majority of the workers exposed by chemical through skin (52.08 percent), while chemical ingestion is the second major reason (26.04 percent) among the workers. There was (12.5 percent) of workers whose reported the chemical inhalation during their work. Detailed data is given in Table 4.

Table 3. Demographic characteristics

Education of the respondents	**OHS awareness**			
	Low	**Medium**	**High**	**Total**
Illiterate	13	12	4	29 (6.04)
	44.8%	41.4%	13.8%	100.0%
Middle	12	47	10	69 (14.38)
	17.4%	68.1%	14.5%	100.0%
Matric	6	198	35	239 (49.79)
	2.5%	82.8%	14.6%	100.0%
Intermediate	14	43	86	143 (29.79)
	9.8%	30.1%	60.1%	100.0%
Total	45	300	135	480
	9.4%	62.5%	28.1%	100.0%
Age	**OHS awareness**			
	Low	**Medium**	**High**	**Total**
Young	16	118	27	161 (33.54%)
	9.9%	73.3%	16.8%	100.0%
Middle	18	138	46	202 (42.08%)
	8.9%	68.3%	22.8%	100.0%
Old	11	44	62	117 (24.38%)
	9.4%	37.6%	53.0%	100.0%
Total	45	300	135	480
	9.4%	62.5%	28.1%	100.0%
Statistics χ^2 cal = 50.95 Gamma = 0.358		Significance = 000** ** = Highly significant		
Working units	**OHS awareness**			
	Low	**Medium**	**High**	**Total**
Processing	15	54	78	147 (30.62%)
	10.2%	36.7%	53.1%	100.0%
Stitching	19	66	34	119 (24.79%)
	16.0%	55.5%	28.6%	100.0%
Weaving	22	30	23	75 (15.62%)
	29.3%	40.0%	30.7%	100.0%
Spinning	30	97	12	139 (28.96%)
	21.6%	69.8%	8.6%	100.0%
Total	86	247	147	480
	17.9%	51.5%	30.6%	100.0%
Statistics χ^2 cal = 75.45			Significance = .000**	

Hazards control measures

Table 4. Distribution of the respondents according to their knowledge about hazards control measures

Statements	Frequency	%age
Hazardous warning signs available at your enterprises		
Yes	401	83.5
No	79	16.5
Hazardous warning signs place at adequate distance		
Yes	379	78.9
No	101	21.1
Language of the warning signs		
English	16	3.3
Urdu	276	57.5
Both	188	39.2
First aid boxes availability		
Yes	374	77.9
No	106	22.1
First aid boxes adequacy		
Yes	293	61.0
No	187	39.0
Employee's trained for emergencies (e.g. first aid training, fire fighting training etc.)		
Yes	161	33.5
No	319	66.5
Knowledge about personal protective equipments		
Yes	219	45.6
No	261	54.4
Feel comfortable by using the available PPE		
Yes	34 (219)	15.52
No	185 (219)	84.47
Wear uniform during work on machine		
Yes	193	40.2
No	287	59.8
Any separate store for the storage of chemicals		
Yes	471	98.1
No	09	1.9
Language of the label on chemical container		
English	320	66.67
Urdu	40	8.33
Both	120	25.0
Methods of chemical transfer and transportation		
Hand trolley	343	71.5
Mini truck	25	5.21
Loader/lifter	93	19.37
All above	19	3.96
Effect of chemical hazards		
Inhalation	60	12.5
Skin	250	52.08
Ingestion	125	26.04
Other	45	9.37
Total	480	100

Relationship between dependent and independent variables Bi-Variate Analysis

In this section an attempt has been made to determine the relationship and the degree of association between dependent and independent variable using Chi-square and Contingency Coefficient statistical techniques.

Table 5 indicates 6.04% workers were illiterate further table shows that 44.8% workers who were illiterate possess low level of knowledge towards occupational health. This may be due to the fact that without education they are not able to understand the significance of occupational health and not conscious and aware to adopt occupation health measures and practices. The result also shows that 13.8% illiterate workers have high level of knowledge about their occupational health. 60.1% workers respondents who had intermediate and above education were highly knowledgeable for occupational health than 30.1% workers respondents who had low knowledge. This trend shows that educated workers had more knowledge attitude and there is direct relationship between education of workers and occupational health and safety knowledge. The value of chi-square at 0.001 % significant level verifies the existence of such association between the independent and dependent variable similarly, the application of gamma statistics also supported the presence of positive relationship between the predicting and response variable. Karaguven (1999) also showed the same results that the poor education is a reason for work accident. Ahsan and Imbeau (2003) also show the same results. Table reflects that relationship between age of the respondents and knowledge about occupational health and safety. According to finding of study the workers who are young and middle age 9.9% and 8.9% had low knowledge about occupational health and safety. Whereas 27% of the young workers have more knowledge and 11% of the respondent's workers of old age and 18% in middle age have high knowledge. This may be due to the fact that old age workers possess more knowledge and awareness about the occupational health and safety measures therefore they adopt more favorable attitude. To statistical test Chi-square and Gamma were used to verify this relationship. The value of chi-square 50.95 was highly significant at 0.000percent level of significant, which reveals that there is strong association between age of the workers and occupational health and safety knowledge. The gamma value, 0.358 shows the positive relationship between dependent and independent variables. It means that higher the age higher will be the knowledge about OHS. The table shows that the highest numbers of workers belongs to

the processing unit. As well as the level of awareness is high among the workers who work in the processing unit i.e. (53.1 percent). Furthermore the (69.8 percent) of the workers who work in spinning unit showed the moderate level of OHS awareness. The same type of results showed by the Saleema *et al.* (2007) and Zafar (2000). Recently Metgud *et al.* (2008) also showed that the working unit plays a significant role in the OHS awareness among the workers. Sheikh (1996) also described the same results.

Person correlation

Bivariate analysis was carried through the use of chi-square statistics to check whether the association between the variable could have occurred by chance or it really exists. Now the Pearson correlation analysis has been carried out to further examine the degree of association among variables.

Table 5. Values of person correlation coefficient

Variables	Coefficients
Age	0.228**
Gender	-0.449**
Background	0.050^{NS}
Education	0.385^{**}
Working Units	-0.326**
Monthly income	0.126**

* = Significant
** = Significant at 0.01 level
NS = Non-significant

Dependent variable occupational health and safety

The table shows the values of correlation coefficients indicating degree of inter-correlation among the major predictor variables and outcome variable.

The results of person correlation coefficients helped to confirm the relationship obtained through the chi-square statistics between the predictor and out come variable i.e. occupational health and safety. The value of correlation coefficient for socioeconomic variables such as respondent's age, gender, background, education, working units and monthly income are associated with dependent variable such as hazardous control measure, health and safety committee, OHS communication and awareness, training and refreshing courses, selection, use and maintain of PPE, information about chemical and its hazards, waste disposal, warning sighs, storage and house keeping, audit, monitoring and surveys, injury treatment centre and health care unit, chemical transportation, social security compensation, labor union, working hours and available medical facilities.

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